Appl. Ser. No. 10/705,498
Amendment Dated August 3, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in this application.

Listing of Claims:

Claim 1. (currently amended) A <u>computer</u> <u>implemented</u> method for reducing the work in process at a given time in the manufacture of one of a product and a series of products by comparing process activity parameters including process setup time and process time per product unit, with the number of different product part numbers processed, changing at least one of said process activity parameters to reduce said work in process<u>, said method including the steps of:</u>

<u>determining the aggregate demand, in product units per hour based on the number of different product units produced at a facility multiplied by the customer demand rate for respective product units per hour;</u>

<u>determining the common minimum batch size for all product units (MINB) for all workstations from the equation:</u>

$$MINB = \lambda \left[\frac{\sum_{i=1}^{N} S}{1 - \sum_{i=1}^{N} \lambda P} \right] = \frac{\Lambda S}{1 - \Lambda P}$$

<u>where λ is the customer demand rate, N is the number of different product part numbers (from i to N), Λ is the</u>

Page 2 of 8

Appl. Ser. No. 10/705,498
Amendment Dated August 3, 2005

aggregate demand for all product units produced in the
facility, S is the setup time required to prepare a
workstation to produce a batch of product units and P is the
time required to process one product unit at the workstation
in question; and

reducing said work in process by selective reduction of
at least one of said product part numbers, said process setup
time and said process time per product unit.

Claim 2 (canceled)

Claim 3 (canceled)

Claim 4. (currently amended) The method set forth in
Claim [3] 1 including the step of:

comparing the non value added cost of process time per
product unit with the number of product part numbers being
processed.

Claim 5. (previously presented) The method set forth in
Claim 4 including the step of:

determining the common workstation turnover time (WTT)
for all workstations processing N product part numbers from
the equation:

$$WTT = \frac{NS}{1 - \Lambda P}$$

wherein all product units have the same demand, setup
time and process time per product unit.

Claim 6. (original) The method set forth in Claim 5 including the step of:

comparing the non value added cost of defective product units with the number of product part numbers being produced.

Claim 7. (original) The method set forth in Claim 5 including the step of:

comparing the non value added cost of demand in product units per unit of time with the number of product part numbers being processed.

Claim 8. (previously presented) The method set forth in Claim 5, including the step of:

determining the average total system inventory in a facility for perfectly synchronized average Work In Process from the equation:

$$\left[\frac{(\Lambda P)J\Lambda S}{1-\Lambda P}\right]+\left[\frac{N\Lambda S}{2(1-\Lambda P)}\right]$$

wherein all product units have the same demand, setup time and process time per product unit.

Claim 9. (previously presented) The method set forth in Claim 5 including the step of:

determining the average total system inventory in a facility for setup-on-batch-arrival average Work In Process from the equation:

$$\left[\frac{J\Lambda S}{1-\Lambda P}\right]+\left[\frac{N\Lambda S}{2(1-\Lambda P)}\right]$$

Page 4 of 8

wherein all product units have the same demand, setup time and process time per product unit.

Claim 10. (previously presented) The method set forth in Claim 5 including the step of:

determining the average total system inventory in a facility for fully asynchronized average Work In Process from the equation:

$$\left[\frac{NJ\Lambda S}{1-\Lambda P}\right]+\left[\frac{N\Lambda S}{2(1-\Lambda P)}\right]$$

wherein all product units have the same demand, setup time and process time per product unit.

Claim 11. (currently amended) A <u>computer</u> <u>implemented</u> method for reducing the work in process at a given time in the manufacture of one of a product and a series of products by comparing process activity parameters including process setup time, processing time per product unit and the number of different product part numbers processed, at one or more workstations, including the steps of:

determining maximum workstation turnover time to produce one minimum size batch of each product at each workstation (WTT_{max}) from the equation:

$$WTT_{max} = \underset{j=1,J}{Max}\left[\frac{\sum_{i=1}^{N}S_{ij}}{1-\sum_{i=1}^{N}\lambda_{i}P_{ij}}\right]$$

Page 5 of 8

wherein, i = part product index (i = 1, ..., N) and N is the total number of different parts or products, j equals the workstation (j = 1,..., J), J is the number of distinct workstations, λ_i is the customer demand rate for part product i in units per hour, S_{ij} is the setup time required to prepare workstation j to produce a batch of part/product i and P_{ij} is the time required to process one unit of part/product i at workstation j; and

changing selected ones of said process activity parameters to reduce said workstation turnover time.

Claim 12. (currently amended) A <u>computer</u> <u>implemented</u> method for reducing the work in process at a given time in the manufacture of one of a product and a series of products by comparing process activity parameters including process setup time, processing time per product unit and the number of different product part numbers processed, at one or more workstations, including the steps of:

determining the batch size ($MINB_i$) for N products from the equation:

$$MINB_i = \lambda_i WTT_{max} = \lambda_i \max_{j=1,J}\left[\frac{\sum_{i=1}^{N}S_{ij}}{1-\sum_{i=1}^{N}\lambda_i P_{ij}}\right]$$

wherein, i = part product index (i = 1, ..., N) and N is the total number of different parts or products, j equals the workstation (j = 1,..., J), J is the number of distinct

Page 6 of 8

Appl. Ser. No. 10/705,498
Amendment Dated August 3, 2005

workstations, λ_i is the customer demand rate for part product i

in units per hour, S_{ij} is the setup time required to prepare

workstation j to produce a batch of part/product i and P_{ij} is

the time required to process one unit of part/product i at

workstation j; and

changing   selected   ones   of   said   process   activity

parameters to reduce said work in process.

Claim 13. (canceled)